AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of identifying a candidate phosphatase and tensin homolog (PTEN) pathway modulating agent, said method comprising the steps of:

(a) providing a first ~~an~~ assay system comprising SEQ ID NO: 5 (a polynucleotide that encodes sucrose non-fermenting like kinase- 1; SNF1LK) or a functionally active fragment thereof, wherein the functionally active fragment encodes a polypeptide comprising amino acid residues 27 – 278 of SNF1LK and has kinase activity, and wherein the assay system is capable of detecting the expression of SEQ ID NO: 5;

(b) contacting the first assay system with a test agent that modulates ~~SNF1LK~~ SEQ ID NO: 5 ~~under conditions whereby, but for the presence of the test agent, the system provides a reference activity; and~~

(c) ~~detecting a test agent-biased activity of the first assay system, wherein a difference between the test agent-biased activity and the reference activity~~ determining the expression of SEQ ID NO: 5 in the assay system in the presence or absence of the test agent of step (b), wherein a difference in the expression of SEQ ID NO: 5 in the presence of the test agent identifies the test agent as a candidate PTEN pathway modulating agent;

(d) confirming that the test agent of (b) is a candidate PTEN pathway modulating agent by providing a second assay system comprising cultured cells or a non-human animal expressing SEQ ID NO: 5, wherein the second assay system measures a change in the PTEN pathway;

(e) contacting the second assay system with the test agent of (b); and

(f) determining a change in the PTEN pathway in the second assay system, wherein a change in the PTEN pathway between the presence and absence of said test agent confirms the test agent as a candidate PTEN pathway modulating agent.

2. (Withdrawn) The method of claim 1 wherein the assay system comprises cultured cells that express the MARK polypeptide.

3. (Withdrawn) The method of claim 2 wherein the cultured cells additionally have defective PTEN function.

4. (Withdrawn) The method of claim 1 wherein the assay system includes a screening assay comprising a MARK polypeptide, and the candidate test agent is a small molecule modulator.

5. (Withdrawn) The method of claim 4 wherein the assay is a kinase assay.

6. (Withdrawn) The method of claim 1 wherein the assay system is selected from the group consisting of an apoptosis assay system, a cell proliferation assay system, an angiogenesis assay system, and a hypoxic induction assay system.

7. (Withdrawn) The method of claim 1 wherein the assay system includes a binding assay comprising a MARK polypeptide and the candidate test agent is an antibody.

8. (Currently amended) The method of claim 1, wherein the assay system includes an expression assay comprising ~~a SNF1LK nucleic acid~~ SEQ ID NO: 5 and the candidate test agent is a nucleic acid modulator that modulates the expression of ~~SNF1LK~~ SEQ ID NO: 5.

9. (Previously presented) The method of claim 8, wherein the nucleic acid modulator is an antisense oligomer.

10. (Previously presented) The method of claim 8, wherein the nucleic acid modulator is a phosphothioate morpholino oligomer (PMO).

11. (Currently amended) The method of claim 1 ~~additionally comprising:~~

~~(d) administering the candidate PTEN pathway modulating agent identified in (c) to a model system~~ wherein the second assay system comprises ~~comprising~~ cells defective in PTEN function and ~~detecting~~ measures a phenotypic change ~~in the model system~~ that indicates that the PTEN pathway function is restored.

12. (Currently amended) The method of claim 11, wherein the ~~model~~ second assay system is a mouse model with defective PTEN function.

13. (Withdrawn) A method for modulating a PTEN pathway of a cell comprising contacting a cell defective in PTEN function with a candidate modulator that specifically binds to a MARK polypeptide, whereby PTEN function is restored.

14. (Withdrawn) The method of claim 13 wherein the candidate modulator is administered to a vertebrate animal predetermined to have a disease or disorder resulting from a defect in PTEN function.

15. (Withdrawn) The method of claim 13 wherein the candidate modulator is selected from the group consisting of an antibody and a small molecule.

16. (Canceled)

17. (Currently amended) The method of claim ~~29~~ 11, wherein the second assay system comprises cultured cells.

18. (Currently amended) The method of claim ~~29~~ 1, wherein the second assay system comprises a non-human animal.

19. (Previously presented) The method of claim 18, wherein the non-human animal mis-expresses a PTEN pathway gene.

20. (Withdrawn) A method of modulating PTEN pathway in a mammalian cell comprising contacting the cell with an agent that specifically binds a MARK polypeptide or nucleic acid.

21. (Withdrawn) The method of claim 20 wherein the agent is administered to a mammalian animal predetermined to have a pathology associated with the PTEN pathway

22. (Withdrawn) The method of claim 20 wherein the agent is a small molecule modulator, a nucleic acid modulator, or an antibody.

23. (Withdrawn) A method for diagnosing a disease in a patient comprising:

(a) obtaining a biological sample from the patient;
(a) contacting the sample with a probe for MARK expression;
(b) comparing results from step (b) with a control;
(c) determining whether step (c) indicates a likelihood of disease.

24. (Withdrawn) The method of claim 23 wherein said disease is cancer.

25. (Withdrawn) The method according to claim 24, wherein said cancer is a cancer as shown in Table I as having >25% expression level.

26. (Currently amended) The method of claim 1, wherein the first assay system

comprises cultured cells that express SEQ ID NO: 15, ~~a SNF1LK polypeptide encoded by a polynucleotide comprising SEQ ID NO: 5,~~ or a functionally active fragment of SEQ ID NO: 15~~, or a functionally active fragment encoded by a polynucleotide comprising SEQ ID NO: 5,~~ wherein the functionally active fragment comprises amino acid residues 27 – 278 of SNF1LK and has kinase activity.

27. (Previously presented) The method of claim 26, wherein the cultured cells additionally have defective PTEN function.

28. (Previously presented) The method of claim 17, wherein the second assay system is selected from the group consisting of an apoptosis assay system, a cell proliferation assay system, an angiogenesis assay system, and a hypoxic induction assay system.

29. (Canceled)

30. (Previously presented) The method of claim 8, wherein the nucleic acid modulator is a dsRNA or an siRNA.